

1. An electro-mechanical device, comprising:
a structure having a major horizontal surface and a channel formed therein;
a conductive trace in the channel; and
a nanotube article vertically suspended in the channel, in spaced relation to a vertical wall of the channel, and electro-mechanically deflectable in a horizontal direction toward or away from the conductive trace.
2. The electro-mechanical device of claim 1, wherein the nanotube article has a vertically suspended extent, and wherein the vertically suspended extent of the nanotube article is defined by a thin film process.
3. The electro-mechanical device of claim 2, wherein the vertically suspended extent of the nanotube article is about 50 nanometers or less.
4. The electro-mechanical device of claim 1, wherein the conductive trace is disposed in the vertical wall of the channel.
5. The electro-mechanical device of claim 1, wherein the nanotube article is clamped at two ends, one end proximal to a base of the channel and the other end proximal to an opening of the channel.
6. The electro-mechanical device of claim 1, wherein the nanotube article is clamped with a conducting material disposed in porous spaces between some nanotubes of the nanotube article.
7. The electro-mechanical device of claim 1 wherein the nanotube article is formed from a porous nanofabric.

8. The electro-mechanical device of claim 1 wherein the nanotube article is electromechanically deflectable into contact with the conductive trace and wherein the contact is a non-volatile state.

9. The electro-mechanical device of claim 1 wherein the nanotube article is electromechanically deflectable into contact with the conductive trace and wherein the contact is a volatile state.

10. The electro-mechanical device of claim 1 further comprising a second conductive trace in the channel in spaced relation to the nanotube article and that can cooperate with the conductive trace in the electromechanical deflection of the nanotube article.

11. The electro-mechanical device of claim 10 wherein the relationship between the nanotube article and at least one of the conductive trace and the second conductive trace is a volatile state relationship.

12. The electro-mechanical device of claim 10 wherein the nanotube article has two vertical extents, one for each vertical wall of the channel, and wherein the device includes a separate, third conductive trace, independently operable relative to the conductive trace and the second conductive trace.

13. The electro-mechanical device of claim 10 further including a second nanotube article, wherein the device includes a separate third conductive trace, independently operable relative to the conductive trace and the second conductive trace, and wherein the nanotube article is vertically suspended and in spaced relation to the conductive trace, and the second nanotube article is vertically suspended and in spaced relation to the third conductive trace, and wherein the second conductive trace is disposed between in spaced relation to the nanotube article and the second nanotube article.

14. The electro-mechanical device of claim 1 wherein the conductive trace is disposed in a vertical wall of the channel and wherein the device further comprises a second and third conductive trace in the channel, and a fourth conductive trace in another vertical wall of the channel, and wherein the device includes a second nanotube article, in a spaced relation to the fourth conductive trace, and wherein the first through fourth conductive traces are independently operable to deflect at least one of the nanotube articles toward at least one of the conductive traces.
15. The electro-mechanical device of claim 1 further comprising a second conductive trace in the channel, wherein the conductive trace is disposed in one vertical wall of the channel and the second conductive trace is disposed in another vertical wall of the channel, and wherein the device includes a second vertically suspended nanotube article, wherein the nanotube article is in space relation to the conductive trace and the second nanotube article is in spaced relation to the second conductive trace.
16. The electro-mechanical device of claim 1 wherein the conductive trace includes an insulative coating.
17. A method for making an electro-mechanical device, comprising:
providing a structure having a channel with two vertical walls and a base and
having a conductive trace having a face exposed to and parallel to one of the vertical walls;
providing sacrificial material on the conductive trace;
providing a nanotube article on the sacrificial layer and substantially conforming to at least a vertically-extending portion of the channel and sacrificial material; and
removing at least a portion of the sacrificial material so that the nanotube article is vertically suspended and in spaced relation to the one conductive trace.

18. The method of claim 17 wherein the sacrificial material is deposited as a thin film and thus the vertically suspended portion of the nanotube article is defined by the thin film deposition.

19. The method of claim 17 wherein the nanotube article is formed by forming a fabric of nanotubes and then removing a portion of the fabric.

20. The method of claim 17 further comprising forming a conductive electrode in the channel before removal of the sacrificial material.

21. The method of claim 20 wherein the nanotube article is formed to have two vertical extents parallel to each wall of the channel and wherein the conductive electrode is disposed between the two vertical extents.

22. The method of claim 17 further comprising forming a conductive electrode in the channel before removal of the sacrificial material forming a second conductive trace in a second vertical wall of the channel, and wherein a second nanotube article is formed that is vertically suspended and in spaced relation to the one conductive trace and to the second vertical wall.

23. The method of claim 22 further comprising forming a second conductive electrode in the channel.

24. The method of claim 17 further comprising forming a second conductive trace in a second vertical wall of the channel and forming a second nanotube article vertically suspended and in spaced relation to the second conductive trace and to the second vertical wall.